

REDHEAD (*Aythya americana*)

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Criteria Scores

Population Trend	Range Trend	Population Size	Range Size	Endemism	Population Concentration	Threats
15	5	7.5	5	0	0	10

Special Concern Priority

Currently considered a Bird Species of Special Concern (breeding only), Priority 2. Not included on the original prioritized list (Remsen 1978) or on CDFG's (1992) unprioritized list.

Breeding Bird Survey Statistics for California

Data inadequate for trend assessment (Sauer et al. 2000).

General Range and Abundance

No subspecies recognized (American Ornithologists' Union 1957, Johnsgard 1978).

Breeds in central Alaska, central Canada, the midwestern U.S., south to southern California, Arizona, New Mexico, and northern Texas. Also nests sporadically in the northeastern U.S. and southeastern Canada and in interior Mexico. Winters in coastal areas from southern Canada south to southern Mexico and Guatemala, the Gulf of Mexico, and along the Atlantic Coast. More than 80% of the wintering population occurs along the coast of the Gulf of Mexico from Florida to the tip of the Yucatan peninsula. Bays and lagoons along the coasts of the Florida panhandle, Alabama, Louisiana, and Texas are important wintering areas, and coastal Texas is a major staging area during fall migration. After the Gulf Coast, the most important coastal wintering area is Chesapeake Bay. In the interior, winters from British Columbia and Washington and throughout the central, southern, and eastern states. Important inland concentration areas include the Great Lakes region,

the Snake, Mississippi, and Ohio river valleys, southern Texas, and California (American Ornithologists' Union 1998, Bellrose 1976, Palmer 1976, Johnsgard 1978).

Seasonal Status in California

Occurs year-round in California. From mid-September to early April, migrants and winter visitors from northern breeding populations augment the relatively small breeding population (Grinnell and Miller 1944, Cogswell 1977). Pair formation begins in winter but courtship activity occurs primarily in March and April (Bellrose 1976). In California, eggs or young have been found from April until August (Cogswell 1977).

Historical Range and Abundance in California

Historically, Redheads were common to locally abundant permanent residents and winter visitors in suitable wetland habitats throughout the state. They were among the nesting waterfowl "...seen daily in numbers..." at marshes of the Los Banos area, Merced County (Chapman 1903). However, their numbers were "...greatly reduced in numbers during the past ten years..." due to drainage of wetland habitats and overharvest by market hunters (Grinnell et al. (1918, p. 150). Thus, by the mid-1940s, Redhead numbers were "...greatly reduced at all seasons..." compared to their former abundance in California (Grinnell and Miller 1944).

Wintering. Wintering Redheads inhabit both saltwater and freshwater environments, and they occurred historically in suitable habitats statewide. In early spring they were especially numerous at San Pablo, San Francisco, and Humboldt bays, and at the Salinas River mouth, Monterey County, where they were often found rafting in association with the more abundant Canvasbacks (*Aythya valisineria*). Redheads were also found at large, deep lakes and marshes of the interior and representative localities included: Honey Lake, Lassen County; Suisun Marsh, Solano County; Deep Springs Valley, Inyo County; San Timoteo Canyon, Riverside County; and Salton Sea, Imperial County (Grinnell et al. 1918, Grinnell and Miller 1944).

Breeding. Historically, the Redhead's breeding population was concentrated in the northeastern plateau, the Central Valley, and southern California (especially coastal marshes). Their southern California status was described as: "...once fairly common during the breeding season, ...now seldom seen at any time of the year..." (H. J. Lelande, *cited in* Grinnell et al. 1918, p. 150). By the mid-1940s, their primary breeding range had been further reduced to suitable, permanent wetlands in the Central Valley, the northeastern plateau, and central coast. Documented breeding locations included: Lower Klamath Lake, Siskiyou County; Tule Lake, Siskiyou and Modoc counties; near Sacramento, and throughout the Sacramento Valley; Alvarado and Irvington, Alameda County; near Castroville, Monterey County; near Los Banos, Merced County; Ventura County; near Buena Vista Lake, Kern County; near Los Angeles, Los Angeles County; San Jacinto Lake, Riverside County; San Luis Rey Valley, San Diego County; and, near Laguna Dam, Imperial County (Grinnell and Miller 1944).

Recent Range and Abundance in California

The outline of the Redhead's wintering and breeding ranges remain largely unchanged from the mid-1940s but both the wintering and breeding populations of the species are reduced, especially in the Central Valley and southern California.

Wintering. Redheads are uncommon, to locally fairly common, winter visitors to coastal waters from Del Norte County south to San Diego County where they are usually found in bays, estuaries, and lagoons. Uncommon in the interior, wintering birds usually occur at large, deep lakes, marshes, reservoirs, and sewage ponds. Midwinter waterfowl surveys conducted by CDFG statewide from 1953 to 2002 indicated a generally declining trend in the average number of wintering Redheads (total individuals) per year during these decades (average/yr [range/decade]): 1950s (2,320 [1,161 to 3,388]); 1960s (2,260 [885 to 6,028]); 1970s (860 [220 to 1,805]); 1980s (1,070 [385 to 1,595]); 1990s (1,650 [257 to 7,237]); and, 2000-2002 (1,405 [633 to 2,895]) (CDFG and USFWS unpubl. data).

In most years the highest wintering Redhead counts were made in coastal estuaries such as San Francisco Bay and south coastal areas and (CDFG unpubl. data). Similarly, summaries of Christmas Bird Count data for California (1945-2001) suggest that a high percentage of the count circles reporting this species are in coastal areas such as Humboldt, Monterey, San Diego, and San Francisco bays. In many years almost half of the Redheads counted statewide were on the Centerville Beach/King Salmon CBC circle in southern Humboldt Bay; numbers on this count have declined from highs of >1,000 most years in the early 1970s (1,700 in 1972) to <300 in most years, and <<100 in many years since the mid-1970s (National Audubon Society 2002).

Important interior wintering areas for this species include: Tule Lake and Lower Klamath National Wildlife Refuges (NWRs), Siskiyou County; Modoc NWR, Modoc County; duck clubs and wildlife refuges of the Central Valley, and the Salton Sea, Imperial County (McCaskie et al. 1988, Garrett and Dunn 1981, CDFG and USFWS unpubl. data). In the northeast interior, locally produced birds are joined by northern migrants in the fall and probably represent the largest inland populations in the state.

Numbers of wintering Redheads are generally low at Central Valley duck clubs and refuges. At the Sacramento NWR complex, <200 birds are usually present and the majority of these can be found in rafts with other diving ducks at deeper ponds in the Butte Sink (Isola and Wolder pers. comms.). In most years, they are uncommon fall/winter visitors to Gray Lodge, Yolo Basin, and Mendota Wildlife Areas (WAs) (D. Feliz, R. Huddleston, M. Womak pers. comms.), the San Luis NWR complex and Kern NWR (D. Hart, D. Woolington pers. comms.). Until about the mid-1970s, Redheads were common at the Salton Sea (about 3,000 birds annually) where about half the state's population was thought to winter (Bellrose 1976). Reduced freshwater inflows to the Salton Sea in recent decades, however, have eliminated many former freshwater wetlands in this area and the wintering population is now <1,000 birds in most years, and only a few hundred in some years (C. Pelizza pers. comm.).

Breeding. Currently, the most important Redhead breeding areas in California are wetlands of the northeastern plateau in Siskiyou and Modoc counties. This species has been greatly reduced as a nester within large portions of its historical range in the Central Valley, south coast, and Imperial Valley.

Aerial surveys for nesting waterfowl have been conducted over suitable wetland habitats statewide from 1949 through 2002 (CDFG and USFWS unpubl. data). Prior to about 1980, these surveys covered major waterfowl concentration areas, but they did not necessarily include the same wetlands each year. During the 1980s, a variety of flight coverages were used until specific and repeatable flight lines were established (following North American Annual Waterfowl Breeding Survey protocols) in the 1990s. Thus, the pre-1980 counts are not directly comparable to those taken during the 1980s or the 1990s. Similarly, the nesting waterfowl surveys have focused primarily on Mallards (*Anas platyrhynchos*) and the seasonal wetlands occupied by this species; counts of diving species were made only as they were encountered during the surveys. For these reasons, the nesting waterfowl survey data should be considered indices of relative abundance and not direct estimates of the species' population size in any year (Yparraguirre pers. com.). Similarly, detections of paired birds during the nesting season does not mean breeding has been confirmed, only that they were present in a given area. Thus, the actual number of nesting pairs that produce broods is an unknown fraction of the total pair count for a given area (C. Pelizza, R. Huddleston, M. Womak pers. comms.).

The statewide Redhead breeding population indices suggest a generally declining trend (average number of pairs [range/decade]): 1950s (8,490 [5,340 to 12,810]); 1960s (4,820 [1,900 to 9,980]); 1970s (2,800 [1,700 to 4,300]) (CDFG and USFWS unpubl. data). Using different survey methods the average numbers of breeding pairs increased somewhat in the 1980s (3,130 pairs [2,258 to 3,991]) and the 1990s (4,220 [1,211 to 11,047]) (CDFG unpubl. data). Since Redheads were not a primary focus of these surveys, the effect of changing survey methods (i.e., following

specific transects) on population indices for this species is unknown (D. Yparraguirre pers. com.). Overall, however, the existing data suggest a statewide decline of this species' breeding population since the 1950s and a possible increase since the 1970s. These population trends could be examined further by compiling the count data by region/year from existing CDFG files.

The northeastern plateau region continues to be a stronghold of their statewide nesting population, but the average number of breeding pairs at the Tule Lake and Lower Klamath NWRs has generally declined (average number of pairs [range/decade]): 1950s (2,960 [1,100 to 4,500]); 1960s (1,823 [900 to 2,550]); 1970s (1,310 [876 to 1,750]); 1980s (1,230 [731 to 1,841]); and 1990s (1,780 [1,142 to 2,785]) (D. Mauser pers. com.). Redheads also nest regularly at Modoc NWR and the annual production has remained fairly stable in the past few decades (average number of young/yr [range/decade]): 1970s (280 [80 to 465]); 1980s (400 [149 to 921]); and 1990s (320 [119 to 655]) (S. Clay pers. comm.).

Wetlands of the eastern Sierra Nevada support small numbers of breeding Redheads, especially in wet years when freshwater marshes provide large areas of suitable habitat. Documented nesting areas include: Honey Lake WA (CDFG unpubl. data); Mono Basin (Gaines 1992); Adobe Lake, Black Lake, and Crowley Lake (Shuford and Metropulos 1996).

Small numbers of Redheads continue to nest in the Central Valley where suitable habitats persist, especially on state and federal refuges and private duck clubs that maintain deep (i.e., > 1 m deep) summer water (CDFG and USFWS unpubl. data). While most state and federal refuges and many duck clubs in the Central Valley maintain some permanent wetlands (usually 10-15% of total refuge acreage), most of these are shallow (< 0.5 m deep) and do not provide suitable Redhead nesting habitat. For example, large areas of seasonal wetlands at the Sacramento and San Luis NWR complexes and Gray Lodge and Yolo Basin WAs support only 15 or 20 pairs (nesting not confirmed) per year. Only a few broods are seen per season on most years at refuges with larger (> 0.4 ha) deep water (1 to 2 m) units (D. Feliz, D. Hart, M. Wolder, D. Woolington, and M. Womak

pers. comms.). Some of the most suitable habitat areas can be found at flooded borrow pits on Mendota WA and at the adjacent Mendota Pool, Fresno County, that maintain deep water (average depth 1 to 2 m) and support about 10 to 12 confirmed nesting pairs annually (R. Huddleston pers. com.). Some other recent documented nesting localities in the Central Valley include: private duck clubs in the Butte Sink and along Honcutt Creek, Butte County; private wetlands near Woodland (some drained in the mid-1990s) and in the Yolo Bypass, Yolo County; and duck clubs in the Grasslands area, Merced County, that may produce up to five broods annually (J. Kwolek pers. com., T. Beedy pers. obs.).

The breeding population at the Salton Sea once outnumbered the wintering population (Garrett and Dunn 1981). However, reduced freshwater inflows have now eliminated many former marshes and populations of nesting Redheads are now only represented by < 100 pairs (nesting status unconfirmed), and usually only a few broods are seen annually (C. Pelizza pers. com.). This species nested formerly in marshes along the lower Colorado River (Cogswell 1977), but nesting has not been confirmed in recent decades (Garrett and Dunn 1981, Rosenberg et al. 1991). A few pairs may be present at some inland reservoirs and coastal lagoons of San Diego County during the breeding season, but nesting has only been confirmed for a few of these localities (P. Unitt pers. comm., Garrett and Dunn 1981).

Ecological Requirements

Redheads usually nest in fresh emergent wetlands where dense stands of cattails (*Typha* sp.) and tules (*Schoenoplectus* sp.) are interspersed with areas of deep, open water (Grinnell et al. 1918, Grinnell and Miller 1944, Bellrose 1976, Palmer 1976). For nesting habitat, they prefer relatively deep wetlands (1 m or deeper) of at least one acre (0.4 ha), with about 75% open water and vegetation up to about one meter in height). They also nest in somewhat alkaline marshes and potholes of the interior (Johnsgard 1968, Palmer 1976).

Redheads are solitary, monogamous nesters that often parasitize the nests of other ducks (including Redheads) and other water birds. However, some females lay eggs only in their own nests or are partially parasitic. Nests are built from marsh plants and secured to tall emergent vegetation; they are usually over water but occasionally on islands or even dry ground. Because of parasitism clutch size is difficult to determine but probably averages about 9 eggs; “dump” nests may have more than 70 eggs laid by several different hens. Reproductive success is generally low in this species, resulting from a variety of causes including interference and desertion by parasitic hens, flooding or drying of active nests, and predation by mammals and birds (Bellrose 1976, Johnsgard 1978, Palmer 1976).

In winter and migration, Redheads forage and rest on large, deep bodies of water and may form rafts far from shore. Food is taken mostly by diving in deep water, but Redheads may also forage in shallow water (< 1 m). Unlike most diving ducks, they consume mostly submergent, aquatic plants such as pond weeds (*Potamogeton* sp.), wigeon grass (*Ruppia* sp.), and duckweeds (*Lemna* sp.) as their primary diet; however, they also take aquatic insects, grasshoppers, larvae of midges and caddisflies, small clams, and snails (Bellrose 1976, Palmer 1976, Martin et al. 1951).

Threats

Primary threats to breeding Redhead populations in California include historical and ongoing wetland losses, nesting failures, and historical and possibly recent hunting pressure.

Wetland losses. Since the early 1900s, the state’s Redhead population has been greatly reduced by the drainage of permanent wetlands that were used for breeding (Grinnell et al. 1918, Cogswell 1977). Of more than four million wetland acres that once existed in the Central Valley, only 561,500 (about 14%) existed in 1939, and this total was reduced to about 243,100 acres by the mid-1980s--representing a reduction of more than 99% from aboriginal conditions. Vast wetland complexes such as Buena Vista and Tulare lakes and wetlands throughout the Central Valley have been eliminated since the early 1940s (Framer et al. 1989, Kreissman 1991). Wetland losses have

had substantial, but unmeasured, effects on the nesting populations of Redheads and other formerly common, wetland-dependent species in the Central Valley such as the American White Pelican (*Pelecanus erythrorhynchos*), Fulvous Whistling-Duck (*Dendrocygna bicolor*), Black Tern (*Chelidonias niger*), and Tricolored Blackbird (*Agelaius tricolor*) (Grinnell and Miller 1944).

Nesting failures. Reproductive success is relatively low for Redheads compared to many other diving ducks (Bellrose 1976, Palmer 1976). One of the main causes of nesting failures is desertion caused by interference from parasitic female Redheads. Other causes of nesting failure include predation by skunks (*Mephitis* spp.), raccoons (*Procyon lotor*), Common Ravens (*Corvus corax*), American Crows (*Corvus brachyrhynchos*), and many species of gulls (Bellrose 1976). Flooding is another frequent cause of nesting failure, along with drying of wetlands during the nesting season. Redheads also tend to concentrate breeding efforts in marshlands that are subject to drainage and botulism outbreaks increasing adult and juvenile mortality rates in affected areas (Johnsgard 1978).

Hunting pressure. Historically, market hunting reduced both wintering and breeding populations of Redheads in California, as evidenced by the declining numbers sold in the markets after about 1910. “The great decrease in its numbers can be partly accounted for by the ease with which it is killed. It is sometimes called ‘Fool Duck’ by sportsmen because of its fearlessness or apparent indifference to their approach. As with the Mallard, we have here a resident duck much hunted for the market. The number of migrants coming in during the winter is small and the annual kill has depleted the local breeding stock. Hence, the Redhead is rapidly decreasing in numbers, and the critical point as regards its survival has already been reached.” (Grinnell et al. 1918, p. 150).

Redheads are currently managed as a “Harvest” species in California, and two can be legally taken per licensed hunter per day during the hunting season. The effects of hunting on the state’s breeding population are unknown, but Redhead populations have increased since the mid-1990s in portions of the upper midwest with continued hunting pressure (USFWS 2002). Hunter recovery

data for juvenile Redheads banded at state and federal refuges have not been analyzed to determine the effects of hunting on annual survival rates of local or regional breeding populations (D. Yparraguirre pers. comm.).

Studies from throughout North America have concluded that Redheads experience high juvenile and adult mortality rates compared to many other species of diving ducks (Bellrose 1976, Palmer 1976). Band recovery data from Utah (1926-1935) indicated mean annual mortalities of about 87% for juveniles and 54% for adults (Hickey 1952). Studies in northeastern California (1948-1963) estimated mean annual mortalities of 79% for juveniles and 41% for adults (Rienecker 1968). A high proportion of the 75 to 100 juvenile Redheads banded per year at Gray Lodge WA in 1973 and 1974 were harvested during the first few weeks of the hunting season (Deuel pers. obs.). Redheads (especially juveniles) may be taken in disproportionately high numbers by hunters since they are relatively easy to decoy and hunt compared to most other waterfowl species (Grinnell et al. 1918).

Informal searches of some recent Central Valley refuge files suggest that only a few Redheads are taken by hunters each season (usually < 20 birds/refuge) (M. Wolder, D. Woolington, M. Womak pers. comms.). While the total harvest of this species on individual refuges and duck clubs may be low compared to other hunted species, the cumulative effects of hunting on the Redhead's statewide breeding population may be significant. Based on limited, existing data it appears that hunting pressure (especially in the early season) may be causing mortality of a high proportion of the locally-produced, first-year Redheads. This may affect the size of the state's breeding population in suitable wetland habitats, especially in historically important breeding areas such as the Central Valley where their current breeding population is small.

Management and Research Recommendations

- Where feasible, increase the extent of permanent, deep water (> 1 m deep) marshes on state and federal refuges to provide suitable breeding habitat for Redheads and other marsh nesting birds such as White-faced Ibis (*Plegadis chihi*) and a variety of egrets and herons. To provide optimal Redhead breeding habitat, such wetlands should be >0.4 ha in extent and offer a mosaic of approximately 75% open water interspersed with dense emergent vegetation.
- Evaluate the causes of nesting failures by this species on state and federal refuges, and summarize these data by major categories such as: nest parasitism, predation (avian/mammalian), water management (flooding/drying), and/or disease outbreaks.
- Evaluate the relationships between the number of pairs counted during aerial surveys of refuges and results of ground surveys (e.g., pairs, active nests, females with broods) to more accurately estimate the breeding population size and productivity on state and federal refuges.
- Continue banding studies to estimate the survivorship of this and other waterfowl species, and to examine the effects of hunting on juvenile mortality and survivorship.
- Analyze existing breeding and mid-winter survey data in CDFG files to estimate population trends by region of the state since the 1950s.
- Analyze existing banding and hunter bag data in CDFG files by season and region to evaluate the effects of hunting on the state's breeding population.
- Based on breeding population and mortality trends, set thresholds for target breeding populations for each major region of the state (e.g., northeastern plateau, Central Valley, south coast) required to maintain or increase regional populations in the historical distribution of the species over a five-year evaluation period.

- If regional breeding populations fall below their targets, use adaptive management techniques to implement seasonal (e.g., late-season only) or regional restrictions for hunting of this species in regions where declines in Redhead breeding populations have been documented.

Monitoring Needs

In addition to aerial waterfowl surveys performed by CDFG and USFWS, ground-based counts for breeding Redheads (e.g., pairs, active nests, broods) should be included during ongoing refuge wildlife surveys that are performed annually by refuge biologists. Special searches for evidence of nesting by this species should be made of any deep water wetlands on the refuges using standardized waterfowl census/brood search techniques. Where possible, suitable wetlands on private lands could also be surveyed for breeding Redheads, possibly under sponsorship of the California Waterfowl Association.

Acknowledgments

(To come)

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